

IM502099

The ETO to CTO Journey

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Learning Objectives

- Learn how to develop a vision on an ETO-to-CTO transition.
- Gain awareness of and learn methods to start implementing CTO products.
- Learn about changing your organization around a CTO process.
- Learn about the impact a CTO transition can have on an organization.

Description

Configure-to-order (CTO) is the method of

“effectively delaying a differentiated product for a specific customer to the last possible point in the supply network (The Push-Pull Point).”

With CTO, modular building blocks are specified in advance which enables an “infinite” number of variants of a product to be configured. The building blocks (or subassemblies) provide the opportunity to design a customer-specific product that is “known” through the entire primary process. In addition to peace of mind and predictability, this provides financial gain through:

- fast follow-up of customer requests due to minimal pre-engineering and predefined prices,
- clear, error-free information flow because it is predefined,
- eliminating order specific engineering,
- scale advantage with suppliers,
- immediate use of CAM programs,
- ability to produce parts “anonymously” in batches during quiet periods, and
- the opportunity to use the capacity created by this methodology to further optimize products and processes and to tap into new innovations.

Speaker(s)

Mischa van Brandwijk

 [LinkedIn](#)

Mischa van Brandwijk is a Customer Success Manager at Cadac Group and an Industry Expert within the Manufacturing Industry with over 30 years of experience.

Mischa worked as an Engineer within various manufacturing organizations where his experience included developing machine production lines, new product introduction processes, prototyping, and developing and managing the design and installation of logistic warehouse systems.

Mischa joined the Cadac Group, first spending 10 years in the role of 3D CAD / PDM / PLM Consultant within manufacturing division.

Within the role of Operations Director, he was responsible for the consultant team and development of industry best practices. As customers within the industry continued to draw on his industry and process knowledge, he took on the role as Customer Success Manager



As a Customer Success Manager, he is a reliable adviser for companies within the Manufacturing industry with regards to their primary process. He loves to help companies with optimizing the processes within their organization and setting out a digital transformation. He is guiding companies with creating awareness on defining ETO to CTO transitions, using, and standardizing product information and implementing effective Product Data Management, Product Configuration Management and Product Lifecycle Management into their company.

Marcel de Goey

 [LinkedIn](#)

In the last 10 years and as a business consultant for the Cadac Group it is Marcel de Goey's job to support customers in developing and executing their Configure-to-Order Journey.

Responsibilities include:

- Investigate CTO potential from an economic perspective
- Define CTO related programs and projects which contribute in realizing companies strategic ambitions
- Form and retain teams for CTO initiatives
- Be the trusted sparring partner for team members
- Connect companies for gaining new insights

It is great to be part of improvement teams that develop and implement new products and processes. It is a privilege to share some insights and experiences with customer examples about Configure to Order.



- Business Consultant @ Cadac Group
- 15 year's experience in Manufacturing Industry
 - Lead Engineer – Semiconductor Industry (5 yrs)
 - Business consultant (10 yrs)
- Specialism
 - Configure to Order initiatives
 - CPQ - PLM selections & implementations

About Cadac Group

Digitalization is in full swing in the manufacturing and construction industries, as well as in governmental organizations. The way you design, create and use data and information is changing radically. The Cadac experts help you embrace this digital transformation. It is, therefore, Cadac's mission to help you realize your digital agenda with enthusiastic experts and excellent products and services.

Cadac believes in Autodesk and Microsoft SharePoint products. Based on these leading solutions and more than **35 years of experience** in your industry, Cadac's experts optimize your design processes to achieve even better **digital designs** and more efficient Document & Product management. The transition from Engineer-to-Order to Configure-to-Order in the Manufacturing & Construction industries is embedded in the Cadac vision & strategy.

Trustworthy, committed, smart and leading. These terms sum up well what makes Cadac. You can count on them. They are reliable and honest. They are committed to a **joint success** with you, the customer. They know what is going on with developments in industry and how you can derive maximum benefits from them. And, finally, they not only try to help you with growth, but they also like to determine the market course for themselves.

Work with one of **Autodesk's** largest suppliers in Europe. They have over **35 years of experience** in optimizing your processes that come into contact with **digital design information**. In those 35 years they have developed thousands of solutions that enable companies like you to design, build and operate even more efficiently.

Cadac **consultants** and **engineers** are experienced in your industry. This experience translates into powerful, customer-specific, and affordable solutions where they think carefully how each solution fits into the **digital landscape** that is needed to achieve your goals, while also pursuing your goals in the most efficient way, **minimizing your failure risk and costs**.

The privately-owned company, headquartered in Heerlen, Netherlands with several offices around Europe, has an annual turnover of € 5.1 million. With 250+ experts and their own applications on top of Autodesk & Microsoft software they help companies around the world to optimize processes and integrate systems. Cadac is driven by its purpose to be ahead of what you think is possible. You can call them pioneers in the digital transformation

Find out more at www.cadac.com



Learn how to develop a vision on an ETO-to-CTO transition.

The CTO journey starts when an organization recognizes the bottlenecks and challenges the organization is facing.

Industry Challenges

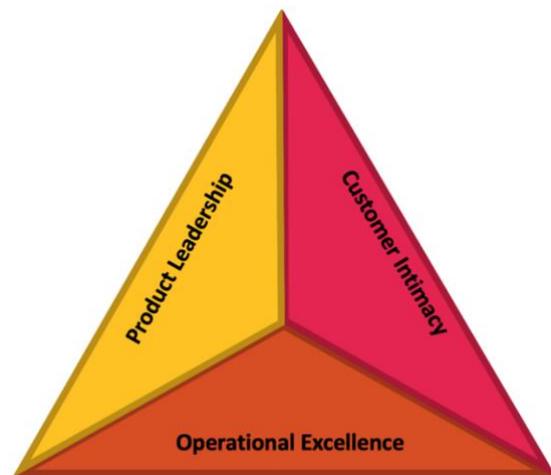
We see a demand trend within various industries where companies are required or have the ambition to make a CTO transition.

This is the reason why within Cadac we have developed and proven an approach to support these companies in realizing their ambitions.

In current times we see a growing number of challenges that many companies struggle with. From the Treacy and Wiersema perspective it is hard for companies to find the right balance between Product Leadership, Customer intimacy and Operational excellence.

In addition, there are companies with a great diversity in their product portfolio that must be able to follow multiple strategies/business processes within their organizations.

- Where Product Leadership refers to:
 - More time for innovation
 - Innovative products
 - Short time to market
- Operational Excellence refers to:
 - Reduce failure costs
 - Increase turnover
 - Shorten order lead time
 - Efficient processes
 - Best price
 - Increase machine uptime
- Customer Intimacy is all about:
 - Reduce quotation lead time
 - Introduce new products faster
 - Optimal customer experience



Typical challenges that companies are facing on a regular basis are:

- Unable to grow
 - Scarcity of technical employees
 - Lack of available competences which results in local heroes and “one-man armies” in the organization
- Unable to develop future products/services due to a lack of manpower/competencies
- Loss of market position and orders
 - Due to “long” delivery times
 - Due to pricing
- Loss of orders/market due to long quotation process
- Organizational inefficiency
- Disconnected departments
- No common language; Lack of understanding between different expertises

Configure to Order

We recognize three types of processes in industry. We identify these as

- Configure to Order
- Engineer to Order
- Design to Order

CTO

Configure-to-order is the method of “effectively delaying a differentiated product for a specific customer to the last possible point in the supply network (The Push-Pull Point)”. With CTO, modular building blocks are specified in advance which enable an “infinite” number of variants of a product to be configured.

The building blocks (or sub-assemblies) provide the opportunity to design a customer-specific product that is “known” through the entire primary process. In addition to peace of mind and predictability, this provides financial gain through: Fast follow-up of customer requests due to minimal pre-engineering and predefined prices; Clear, error-free information flow because it is predefined; Order engineering is no longer necessary; Scale advantage with suppliers; CAM programs can be used immediately; Parts can be produced “anonymously” in batches during quiet periods.

The capacity created by this methodology can be used to further optimize products and processes and to tap into new innovations.

ETO

Engineering to Order means that the creation of the required product data is developed and specified during the order, usually by Engineering. The technical concept of the product is usually clear, but the product data is not fully specified or available within the primary process.

DTO

Design to Order means that the creation of the required product data is developed and specified during the order, usually by Engineering. The technical concept of the product is completely unknown and must be fully developed and validated within the primary process.

As-Is

The two main processes used in the industry are often defined as ETO & DTO. Both of these processes begin with a customer and a salesperson getting clarity and an agreement on the commercial and technical requirements. Once there is an order the engineers start by designing the product. And once new functionality is required R&D join the process. When the product is released work preparation and purchasing can start with calculating and purchasing components.

Once all the required components are produced and delivered, the assembly process can start. After testing, the product can be commissioned and installed at the customer site. Maintenance is then transferred to the service organization.

- Within these processes products are referred to as:
- One-Off a kind products, Specials or Customer Specific solutions.

Due to all kinds of missing information and unclarities within the specification process a lot of communication and rework needs to be done to be able to deliver a functional product. As these processes are being executed it often seems like they are being experienced for the very First Time.

Gain awareness of and learn methods to implement CTO products.

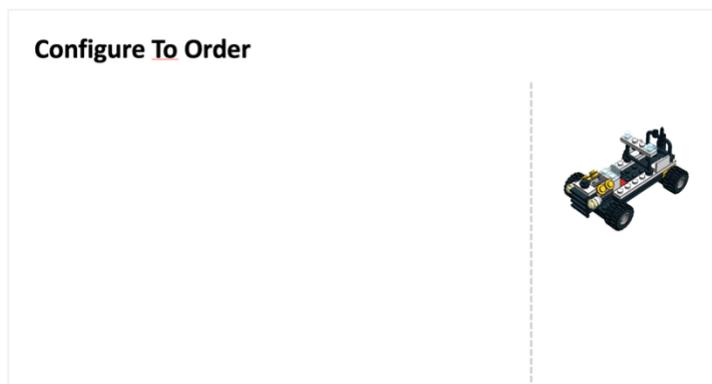
How can CTO help you out?

To establish a common language about CTO terminology, a Lego car is used as an example.

The following terms are explained

- Modules
- Variant
- Configuration
- Product Platform
- Product mix

Imagine the Lego car on the right of the slide as one of the specific products for a customer. For a manufacturing company this product could be “a machine”. For a construction company the product can be “a house”



Every product consists of some typical components. These collections of components are called “Modules”. A “Module” is a generic collection, it has no physical representation or identification. On the slide 5 examples of modules are displayed:

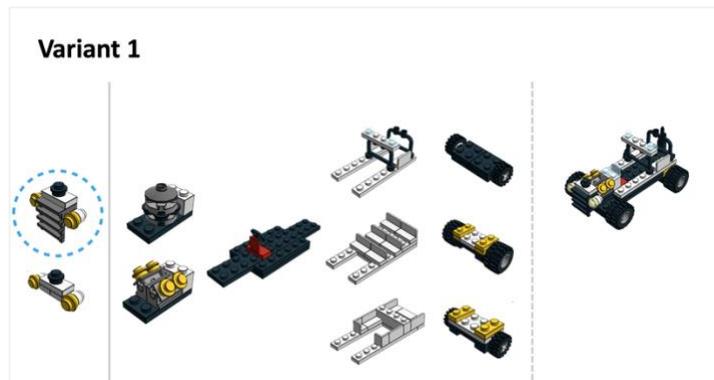
- A front module
- An engine module
- A chassis module (in the middle)
- A body module

An axle module (on the right side)



The front module on the left comes in different representations.

Within the highlighted circle the front is executed with a radiator.
We call this a **variant** of the front module.



Under the “radiator” variant there is a variant without the radiator. This is the second variant, highlighted in the circle.

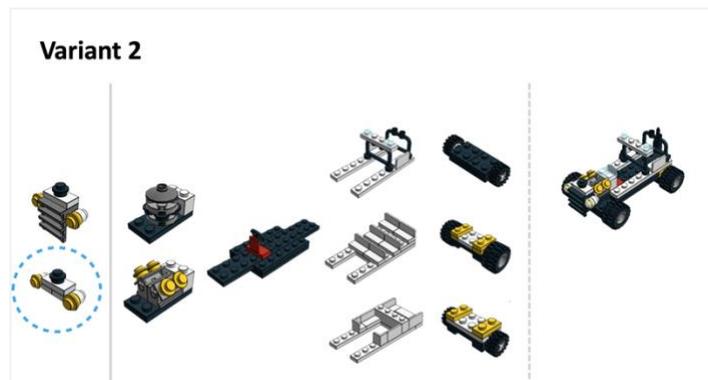
Modules are “generic” and are displayed horizontally. Variants are “specific” and are displayed vertically.

In the case of variants

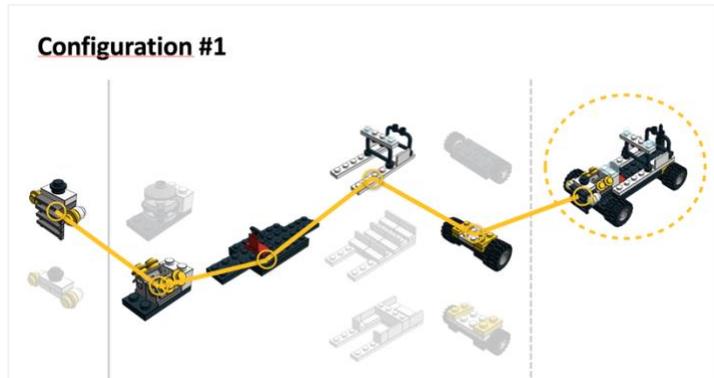
- Specifications are known
- Costs involved are known
- Interaction with other variants are known
- Interfacing can be defined

There is one exception → “the chassis” located in the center of the slide. There is only one variant of this module.

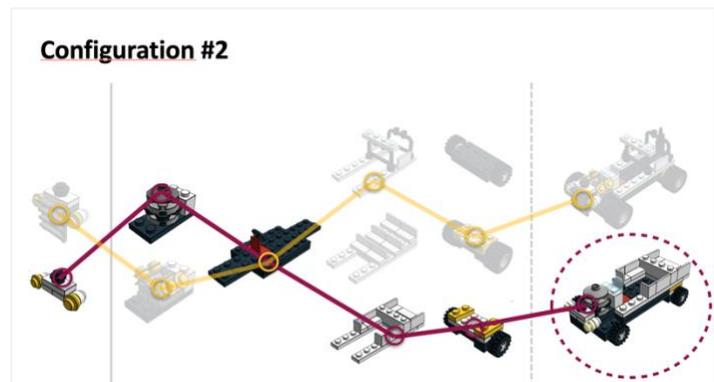
This means that every car uses the same execution of the chassis. (This makes a lot of people happy.)



To create a product, a certain set of interfacing variants which can be combined. The product, in the yellow circle on the right, is called a “configuration”.



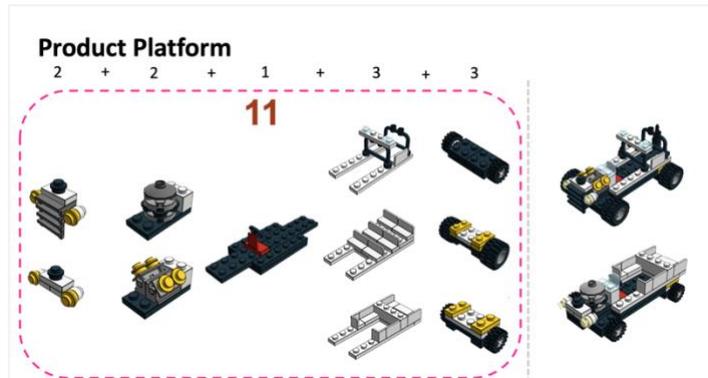
For another product a different set of variants is being used. This is the second configuration.



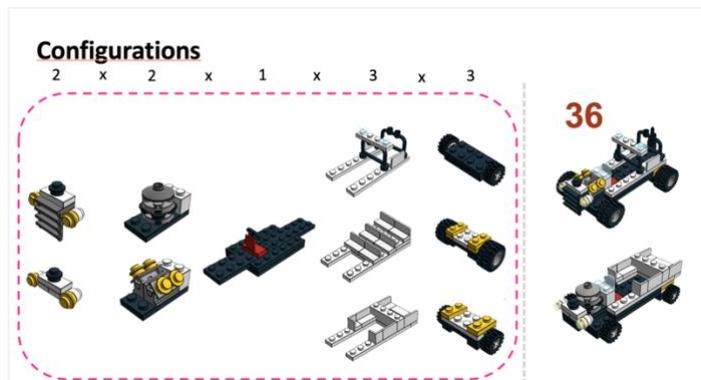
The collection of all these variants is called a “product platform”. It is important that the content of the product platform matches the market needs for a certain period of time. This is where Product Management begins.



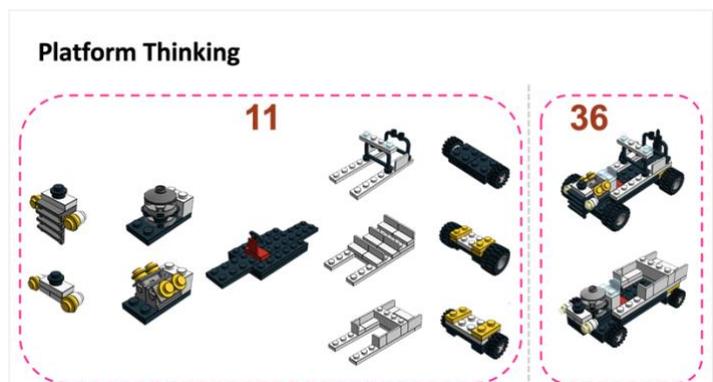
In this example, the “Lego product platform” consists of 11 variants.
This is the sum of the variants.



Change the sum into a multiplier and the 11 variants allow 36 unique product configurations to be created.



Using the 11 variants, 36 configurations can be created, while only maintaining the specifications of these 11 variants (instead of 36 products). That is a huge difference in terms of workload for organizations.



Learn about changing your organization around a CTO process.

What's in it for you?

When introducing a Configure to Order way of working in your organization, sooner or later every department is affected.

Imagine the following benefits for your departments. CTO is the enabler of these benefits due to changing the activities within processes.

Engineering / work preparation

Imagine the product platform is available for the sales organization or even for customers.

Based on a configuration process they are able to configure the required product and reserve a timeslot for production instantly.

Involvement of the engineering and work preparation department is no longer required since all the product specifications are validated and released upfront.

The engineering time that becomes available can be used for:

- innovation
- design updates
- more difficult DTO projects for example.

Sales

Imagine the product platform is implemented in CPQ software which makes it possible for salespersons or agents to instantly:

- configure (multiple) products.
- generate quotes automatically.

This can even be done on the customer site and with the use of mobile devices.

CPQ in the sales process is all about “Being the first, and the first time right”

Production / Assembly

Instead of using no or limited tooling we can think about a fully automated production process. As long as we are able to create repetition in the product design.

Because of the predictability of the products for assembly, working spaces can be effectively arranged.

These working spaces will only have the required tools available. Therefore, there is minimal room for error.

In addition: All kinds of instruments from the “lean manufacturing toolkit” become more interesting to use.

Testing

Imagine separate testing of sub functionalities since there is no longer need to build and install the complete product. It can be done separately and in sub functionalities.

There is no FAT or SAT process required anymore.

Once the product is installed on customer sight it performs as expected.

Organization

When departments transfer product information within processes it is important to be aware of the correctness of your product data.

The configuration management institute stated that if the correctness of your data declines by only 8%, the resources needed to execute a process which contains 8 activities will be doubled because the effectiveness of employees drops by 50%!

Financially

In this example illustrated below, the project effort within a classical ETO process and a typical CTO process are compared.

What does it mean Financially?

Classic ETO Effort			Typical CTO Effort		
• Sales			• Sales		
• Engineering		120 Hours	• Engineering		0 Hours
• Work preparation		20 Hours	• <u>Workpreparation</u>		0 Hours
• Procurement		20 Hours	• Procurement		8 Hours
• Production			• Production		
		+			+
	TOTAL	180 Hours		TOTAL	8 Hours
• Annual, 50 projects	=	9000 Hours	• Annual, 50 projects	=	400 Hours
• @ \$ 50,= hour rate	=	\$ 450.000,00	• @ \$ 50,= hour rate	=	\$ 20.000,00

Annual saving: \$ 430.000,00

Industry benefits

In general we see companies experiencing the following benefits.

- Product cost price will be reduced
- Quality improves due to more repetition
- Shorter delivery time due to eliminated workload
- Less diversity improves availability of spare parts
- Service- and upgrade time reduces due to the exchangeability of modules

Summarized



Specials = ETO

- No repetition
- "One-offs, specials"
- Engineering = bottleneck
- Copy of copy = Inherited errors
- No time for development/innovation



Standards = CTO

- Repetition
- "standards"
- "No" engineering effort
- Improved Quality - Lean Production
- More Innovation

QUICK + COSTEFFICIENT + NO ERRORS + FIRST TIME RIGHT

Learn about the impact a CTO transition can have on an organization.

Great but how?

Most important: You need to embrace change!!!

Embracing change implies that you don't see change as adversity, but as an opportunity to improve yourself and try new things.

You need to be positive about your situation, capabilities, and ability to adapt to change. It can allow you to enjoy new experiences, develop new skills and ideas, learn new knowledge and information.

It can allow you to meet new people, enjoy new experiences, develop new skills and ideas, learn new knowledge and information, and achieve great feats.

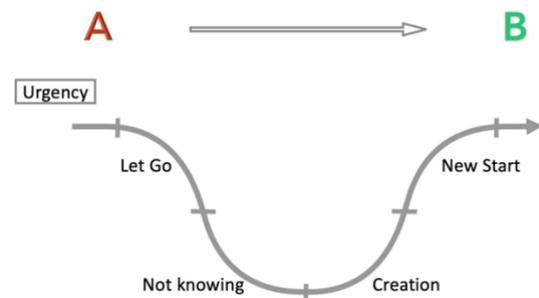
Change can help you transform and have breakthroughs. You'll never know what can become and what can happen until you do it.

The possibilities with change become endless.

In the end we are all people with emotions, and we go through the process which everybody knows as the **“the Kubler-Ross grief curve”**

It is important to know that this process is being experienced:

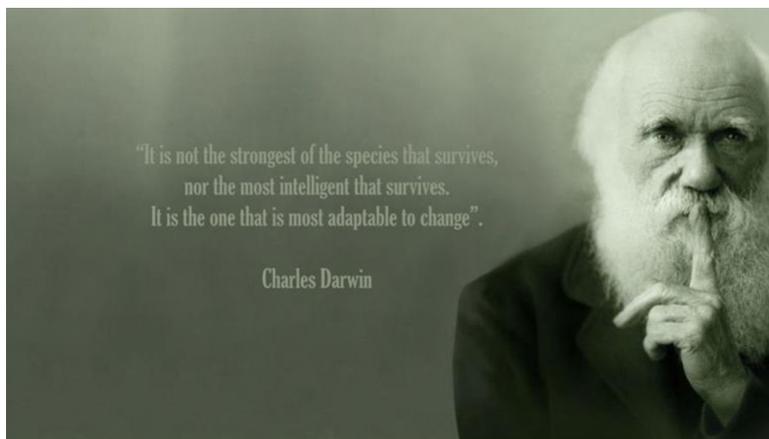
- As an individual.
- As a department. (Engineering department / sales department for instance)
- And in the end as entire organization.



Everybody will go through these different phases at their own pace.

We can all imagine that an employee with 30-years of experience has more “to let go of” than a student who just started their first job.

Knowing this it is absolutely mandatory to be aware of people struggling with these emotions, in different phases and that support needs to be given.



Program Approach

Why Change

The intended change concerns a necessary adjustment of your primary business process and of the organization that carries out this process. You find this adjustment necessary in order to be able to continue to meet the requirements that your customers place on you in the future and to maintain or strengthen your market position.

With the help of this document, we show how you can define and realize the desired change. In addition, we show how you can organize the change program and which roles must be fulfilled. Achieving change that affects many, if not all, parts of your organization is not easy. The road that you and your organization have to take is full of bends and pitfalls. There may be reasons to change the planned route along the way. After all, the world around you does not stand still and you have to move with it. Realizing the desired change requires thorough preparation. During the implementation of the program, you need to regularly assess the progress and have the opportunity to make adjustments.

Focus on business goals

To adjust your primary process, you don't do it overnight. You recently conducted a thorough analysis of your business goals with members of your executive team. Or are you currently working on that? In any case, the conclusion may be that the feasibility of these goals with your current business operations and the current structure of your organization is questionable and that for this reason you wish to adjust the process, the organization, and the information processing. The next question then is: how? What do you adjust?

Cadac has developed the 'Cadac program management' methodology, with which we want to help you define the desired change in concrete terms. After that, you can successfully realize the change. With this methodology we keep a constant focus on achieving your business goals.

Vision, Business case, Program client and Sponsors

The management of your company or organization sets goals for the organization based on vision. The management is the owner of the vision, and it is therefore also the owner of the goals that it wishes to achieve by managing the organization. We call the business reasons for realizing the desired change the Program Business Case. The owner of this business case is the Program Client, and he/she is a member of the management team. The other members of the management team are sponsors of the change program. They all have an interest in the results of the change program.

What is program management and why is it necessary?

What is a program?

A (change) program is the whole of related activities and projects in a temporary organization to realize one or more predefined objectives, which are of strategic importance.

What is program management?

Program management is the coordinated organization, direction, and implementation of a program.

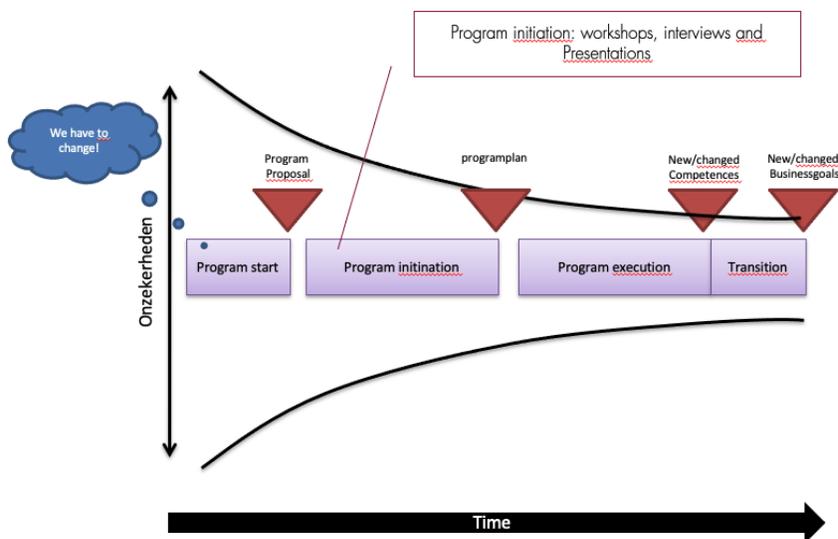
Why is program management necessary?

Program management ensures the controlled control and implementation of a company-wide change by means of prioritizing and executing activities and projects, so that new competencies are developed and anchored in your organization and so that new and/or adjusted business goals can be achieved.

Phased approach for definition and realisation

Phasing model

The figure below shows a phasing model for a controlled definition and implementation of a change program.



Goal

- Define program
- controlled realization of the program

Program start

Goal

This is the first phase of the change program. The phase starts with the investigating in the feasibility of your wishes for restructuring your primary process, the organization that must be able to carry out this process and the information processing.

The purpose of this phase is to draw up a program proposal. You have meetings with your team about your wishes for implementing a change in your primary process. The aim is to assess how the intended change can best be achieved. The outcome of this assessment may be:

- The objectives of your organization are fixed and do not change. The desired change concerns part of your process and affects a limited part of the organization. This change can be realized by carrying out one or more projects.

or

- You have adjusted the objectives of your organization in response to the changed external environment (politics, market, competitors, technology). Your conclusion is that you must adapt and renew the primary process accordingly. The change concerns a large part of the primary process and affects all parts of your organization. This change can be realized by implementing a change program.

Program proposal

After assessing your wish for change, you must draw up a program proposal. The program proposal outlines:

- Your business reason for the program, the program business case.
- The approach needed to define the program.

The program proposal provides a formal basis for assessing whether the change program is sufficiently viable and for deciding to initiate the program.

Program initiation

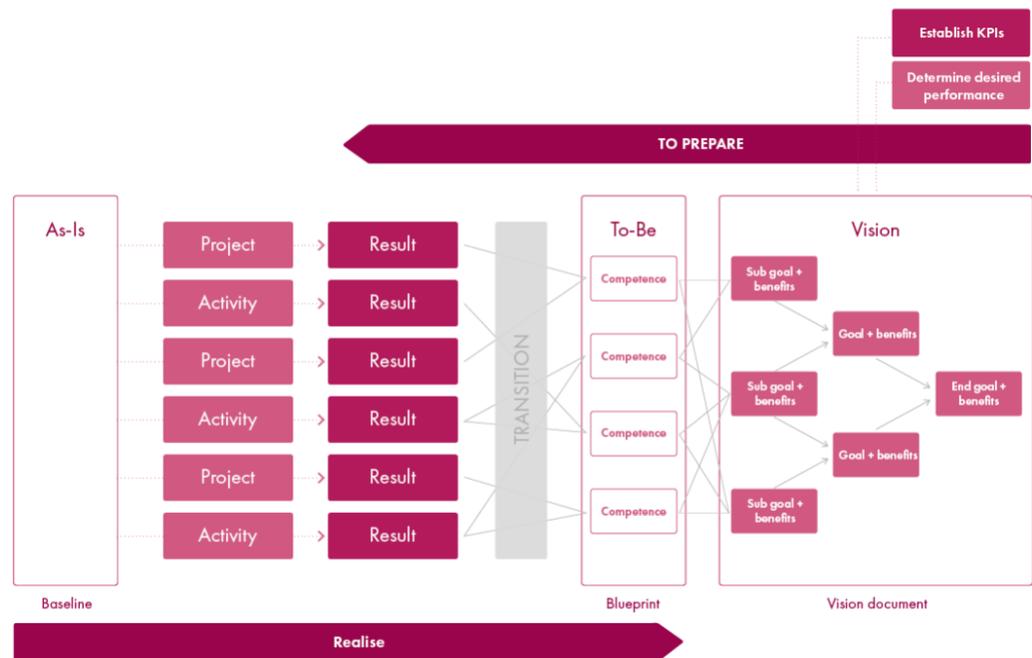
Goal

The purpose of program initiation is to define the change program. This will take a number of days for conducting workshops, interviews, presentations and elaboration and presentation of the program plan. You need some key players from your organization during these workshops.

- The owner of the program business case, this is a member of your executive team. The owner explains the policy, business strategy and business initiatives of your organization.
- One senior executive, who can fulfill the future role of program manager.
- Additionally, some senior managers. These executives can play the future role of change manager.

Using a canvas to define a program

You can apply this canvas during the program initiation workshop to determine the vision, required competencies, activities, and projects. A zero measurement is performed separately. Your organization's participants are board members and senior management.



During the workshop you have to collect inputs for the following aspect areas:

- Vision:
 - goal analysis and determination of the program business case (this was already described in concept in the program proposal).
- Blueprint:
 - desired competencies that are necessary for the realization of goals.
- Project portfolio:
 - the various activities, projects and results that are necessary for the acquisition of desired competences.
- Program scope:
 - Current process (in outline) and the organization/business units that implement it.
 - Critical work processes or parts thereof and identification of bottlenecks.
 - Current and future information processing systems, existing or required links for data exchange and required security.
 - Risks and control measures.

- Program organization:
 - implementation of the roles within the sponsor group (program client and sponsors), program manager, change managers.
 - Relationships with ongoing or planned activities and projects within your organization.
- Program issues:
 - any issues you need to investigate further.

We briefly explain the different parts of the program plan below.

As-Is situation (baseline measurement)

As-Is

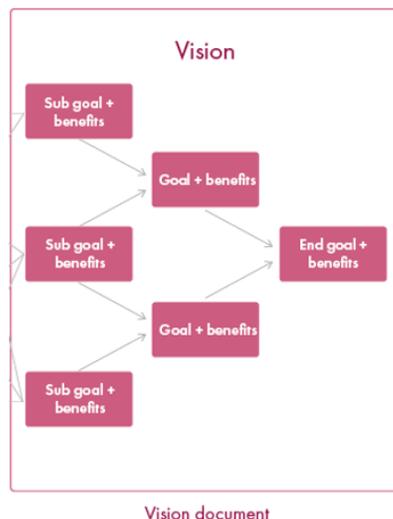
The baseline measurement takes place in the form of a few interviews with key persons in your organization. You need to define questions about essential business aspects to a number of your employees.

This provide an image of the current process and how it is believed that this process functions. With the interviews you appeal to a broad cross-section of your organization. This contributes to creating awareness and support for change.

On the basis of the baseline measurement, we also determine how the cost development is progressing within the current process and what the lead times of primary activities are within the current process.

Baseline

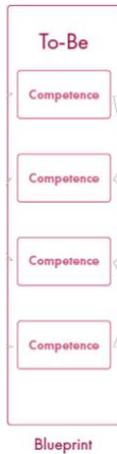
Vision document



This is an overview and description of the goals you wish to achieve by implementing the change program. These goals are derived from the context of the external environment, such as politics, market, competitors, and new technology. By realizing goals, the customer organization secures its right to exist, continuity and growth. The goals are ranked by decomposition from higher goals to lower, derived sub-goals. For the sub-goals at the lowest level, we formulate a proposal for each sub-goal of how the performance on this target can be measured. These are the so-called key performance indicators (KPIs).

The objectives and KPIs together form the vision document of the change program.

Blueprint



You need to investigate which skills – we call them competences – are necessary to achieve the objectives of the lowest level. We try to indicate to what extent these competencies will contribute to the realization of the objectives. The competences together form the Blueprint of the change program.

Efforts

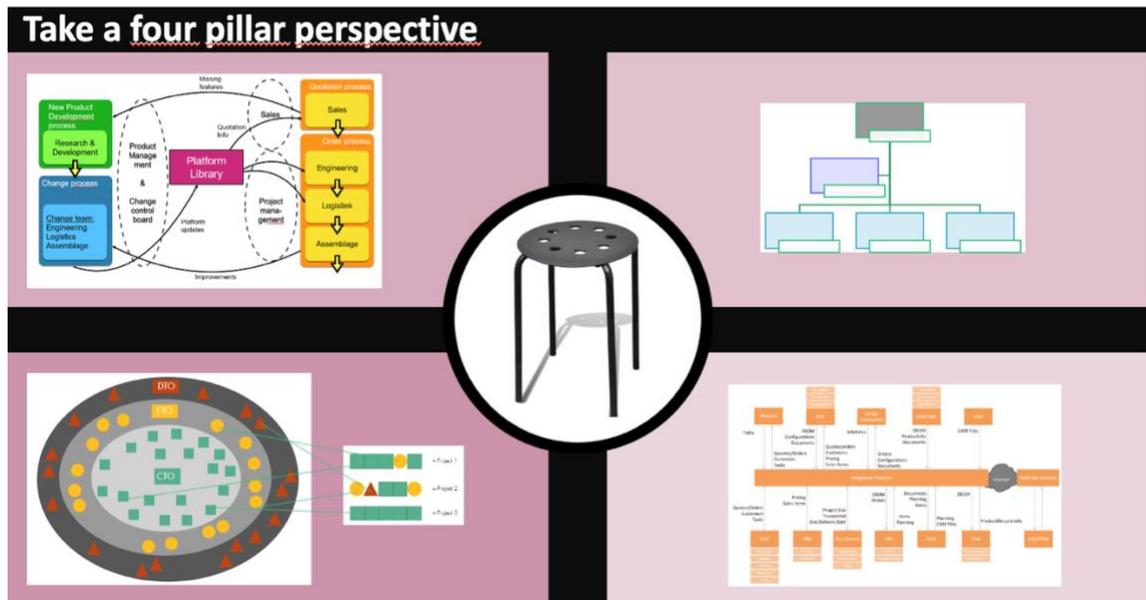


This is an overview of possible projects and activities needed to acquire new and adapted competencies. Transferring the results of the projects and activities to new or adapted competencies is what we call “transition”. The transition is a responsibility and task of the change managers of the program. We refer to the entirety of projects and activities as the project portfolio of the program.

Projects & Activities

Projects and activities have to do with the 4 pillars that needs to be in balance within you company

- Product
- Process
- Organization
- IT



The product is your IP that you put on the market. Make sure the platform is defined and that it matches the market need. After definition, this platform can also be maintained by product management.

Set up the correct processes within the organization whereby each type of product is assigned its own order process that is as efficient as possible. In general, the yellow process (primary processes) is in place but NPD and change processes are not defined.

On the basis of process, the organization will probably also have to be adjusted on certain points. New roles will arise that must be given a place. Maybe even move people to roles that better fits with their capabilities/competencies

Based on Product, Process, and organization we can design the IT landscape with which the organization will work in the coming years.

The Program Initiation Workshop, Goal Analysis

You need to start the program initiation with a program initiation workshop. The first activity of this workshop is a goal analysis. The most important question is: 'Where do you want to be in the market within the next five years and how do you want your customers to recognize you?'

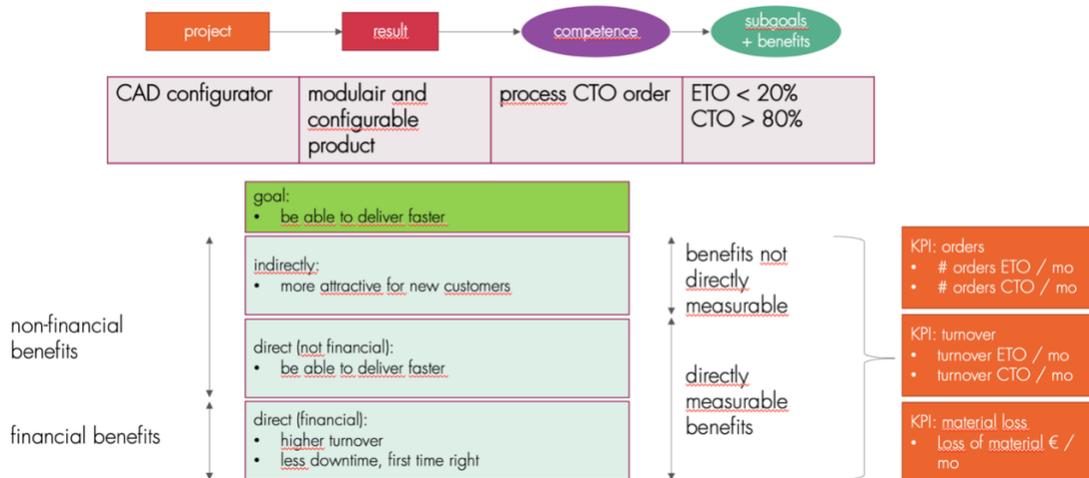
You explain the policy, business strategy and initiatives of your organization. Then try to establish underlying goals. For the lowest-level sub-goals, try to define benefits. The goal analysis ends when these sub-goals are sufficiently simple and concrete. This usually turns out to be the case when the third sub-level is reached.

During the further detailed development of the program, determine what a practical key performance indicator (KPI) is for each sub-goal of the lowest level. These KPIs are the measuring instruments from which you can read during the implementation of the program to what extent the relevant sub-goal has already been achieved. The interpretation of the current picture of the various KPIs may prompt you to adjust the program, for example by:

- modify one or more activities or projects,
- add or remove one or more activities or projects,
- carry out one or more activities or projects earlier or later.

KPI's

Below an example of a KPI for the sub-goal 'being able to deliver faster'.



As part of a change program, a project "CAD configurator" has been defined. The aim of the project is to set up the technical environment, with which the Sales department can record a configuration desired by the customer in the product design. The result of the project is a modular and configurable product. By carrying out this project, the client's organization acquires the competence to process customer orders according to the 'configure to order (CTO)' method. This competence contributes to achieving the objective of producing at least 80% of orders according to the CTO method. For a

maximum of 20% of the orders, the organization will apply the engineer to order (ETO) method. For ETO, engineers will make the design in accordance with the requirements and wishes of the customer. Direct engineering work is no longer required for CTO, except for maintaining the configurable CAD models required for CTO.

Various benefits have been defined for this KPI: both financial and non-financial benefits, and directly measurable and not directly measurable benefits.

Periodically measuring KPIs is typically a task of a business office within your organization. During the implementation of a change program, this can also be done by a program office. This program office is part of the program organization. After completion of the change program, the measurement of the KPIs is then transferred to the 'standing organization'.

Competencies for achieving sub-goals

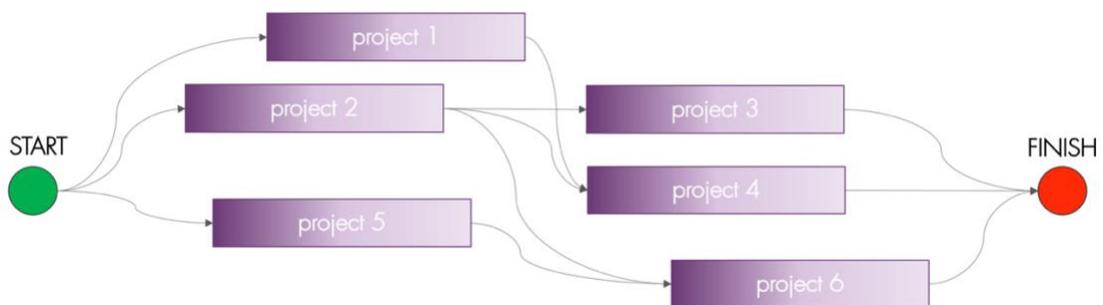
In order to achieve one or more sub-goals, members of your organization will need to have certain competencies. After you have determined the sub-goals and KPIs, you investigate which competencies are needed to realize the sub-goals. These can be existing competences that you have to adapt or new competences to be acquired.

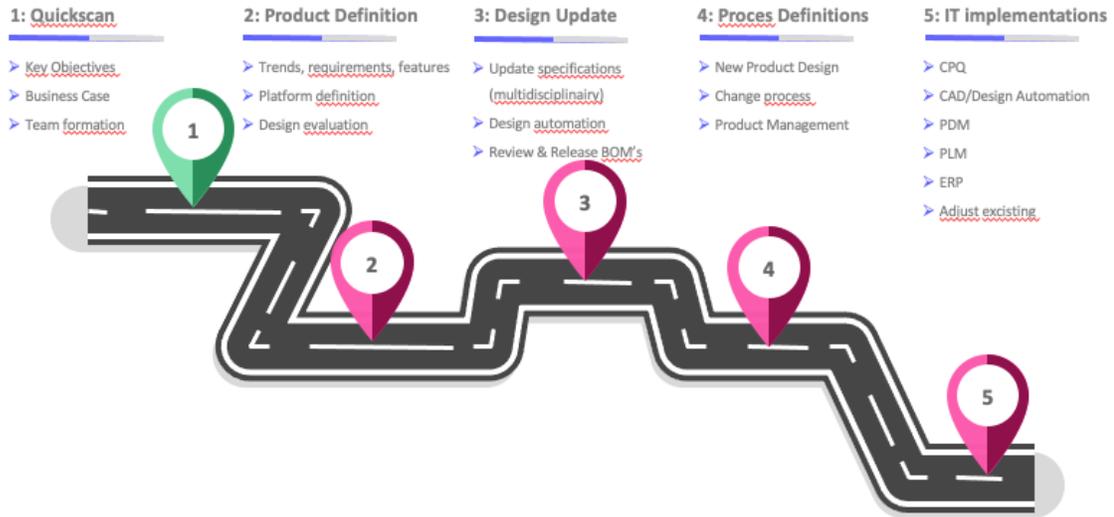
Project Flow Chart

You need to make an inventory of which activities and projects and which results are required to enable the new or adapted competencies.

For each project you need to draw up a project proposal (PRINCE2 term: project letter). Finally, you need to investigate the dependencies between the projects and activities. In a project flow chart, you need determine the optimal order of the realization of the projects and activities in time.

Below a schematic representation of the dependencies of different projects within a portfolio on each other and the order of their execution.

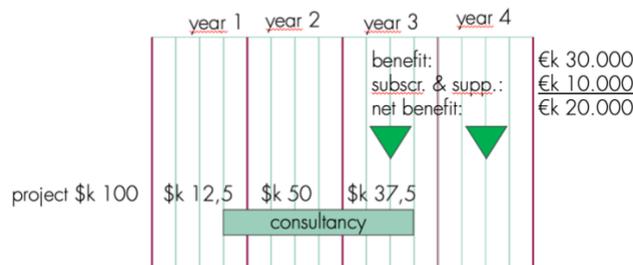




Costs and benefits

Below an example of the settlement of the investments for and the benefits of the realization of a project in the program business case.

Distribution of investments and net benefits over time



The realization of projects requires certain investments. We divide the investment for a project over the years in which the project is planned or as it was carried out over time. The distribution is in proportion to the duration of the project in a year.

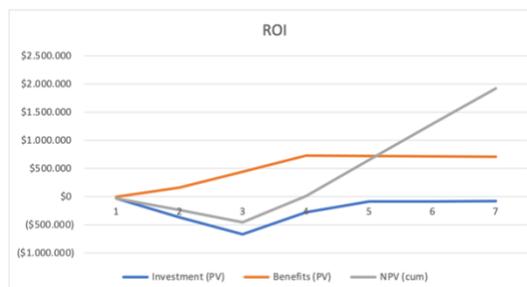
After a project has been carried out, the expected benefits are immediately available after the transition of the result. These benefits are included in the financial assessment of the program plan:

- Benefit in the year in which the project – or cluster of projects – was completed. This income will also appear in the following years.
- Negative benefit for software subscriptions and maintenance. This negative income will also appear in the following years.

Return on investment (ROI)

You need to calculate the return in investment (ROI) based on net present value (NPV). This is a common methodology for evaluating the investment required to carry out projects and programs.

NCW Analysis			
Benefits	Investment (PV)	Benefits (PV)	NPV (cum)
\$0	\$ -29.260	\$ -	\$ -29.260
\$161.216	\$ -362.400	\$ 159.620	\$ -232.041
\$455.440	\$ -665.014	\$ 446.466	\$ -450.589
\$755.440	\$ -273.396	\$ 733.222	\$ 9.238
\$755.440	\$ -82.356	\$ 725.963	\$ 652.844
\$755.440	\$ -80.456	\$ 718.775	\$ 1.291.163
\$755.440	\$ -79.660	\$ 711.658	\$ 1.923.161
\$755.440	\$ -78.871	\$ 704.612	\$ 2.548.903
\$755.440	\$ -78.090	\$ 697.636	\$ 3.168.448
\$5.149.293	\$ -1.729.503	\$ 4.897.952	



business case key figures	
earnback period	4 - 5 jaar
benefits / year (end program)	\$k 840
benefits / order	\$k 5,5
investment year 1	\$k 300 - 400
subscriptions & support / year (end program)	\$k 85

Figure: a practical example of an investment analysis by calculating the net present value of a project portfolio. At the bottom left are key figures for the substantiation of the business case (BC key figures). The graph on the right shows a earn back point after four years from the start of the realization of the portfolio.

The green table shows the inputs for the calculation for successive years: the required investments and the expected benefits.

The net present value is calculated in the white colored table. In this example, we assume an interest rate of 8% (industry standard, based on average return on investment within a manufacturing environment).

Elaboration of the program plan

Finally, you process the information obtained during program initiation into a program plan. The principal content of the program plan is:

- Zero measurement
- Vision Document
- Blueprint
- Goals and KPIs
- Competencies
- Project portfolio and project flow chart
- Benefit plan
- Program organization and interpretation of roles

Program execution, transition, program support

After the program plan has been approved by the board, the program execution phase starts. During this phase, the various projects of the program are realized in further detail and in order of priority, as laid down in the project flow chart. The program manager orders separately for the various projects or clusters of projects

Transition

Change managers safeguard the results of the completed projects within the business unit for which they are responsible. We call this transition. The change managers are leaders within the customer organization. The aim of transition is to convert the results of the projects into adapted and new competencies of employees by means of education and training. In this way project results are anchored within the organization. The competencies are described in the blueprint that is part of the program plan.

In practical terms: members of the organization will work according to the implemented process and according to the agreed and trained working methods. They make use of new and adapted IT infrastructure: computer systems, networks and efficiently designed applications.

Program-evaluation

At the end of the implementation of the program an evaluation will take place of:

- The way in which the program was executed.
- The benefits achieved, both qualitatively and quantitatively.
- The extent to which the objectives set in the vision document have already been achieved.
- Learning points for the customer organization as a result of the realized program and projects. Lessons learned are valuable. You can 'cash in' these in any subsequent programs and projects.

Program Organization

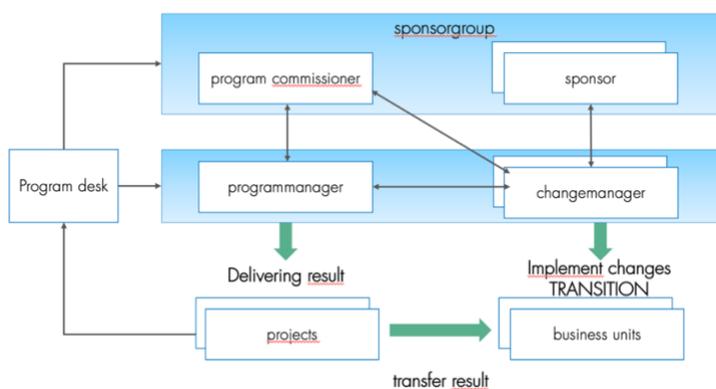


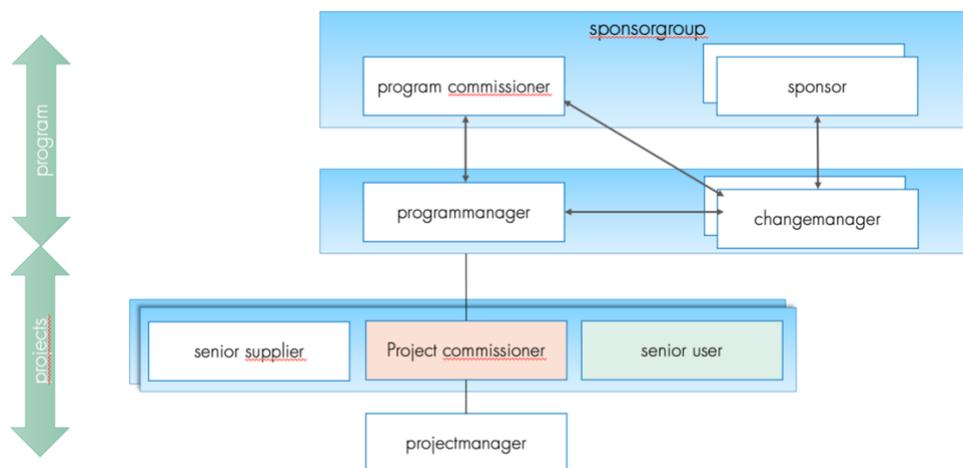
Figure: the organization of a change program. The sponsor group consists of members of the management who are involved in the change program. Managers can fulfill the role of change manager within the change program.

Roles

Sponsor group	All ultimately responsible managers of business units who are involved in achieving the program goal and in realizing the associated added value.
Sponsor	Sponsor group member, usually a member of the company's management team or board of directors.
Program commissioner	Person who is ultimately responsible for the program. Member of the sponsor group. Owner of the vision for the program.
Program manager	Responsible for the day-to-day management of the program. Reports directly to the program client.
Change manager	Is primarily aimed at realizing the benefits (added value) within the own business unit.
Program desk	Organizational unit responsible for the administrative support of the program.

Integration program and projects

Within one change program we will be able to define different projects. For all these projects, the program manager fulfills the role of project client.



Critical success factors

In this section we briefly explain some success factors for the success of a change program.

Explain the need

This is a responsibility and a task of management. In concrete terms: mapping out the threat and making it tangible. It is absolutely important that every member of your organization experiences and understands the need for change. The program should translate this need into concrete activities that can be taken up by members of your organization.

Involve top management

It is essential to inform and involve all managers within your organization in the change program. They can fulfill an active role as change manager within the change program. It is then their responsibility to translate the results of activities and projects into new or adapted competencies of the employees for which they are responsible. Cadac offers them support in the form of education, training, and guidance in testing automated information processing.

Ensuring an owner at the top of the organization

The program commissioner is a member of the management team. This person is the owner of the change program and is therefore also the owner of the program business case. The program business case describes the business justification of the program. The program commissioner has been given the confidence and mandate from the management to start up the program and to prepare it thoroughly. After approval of the program plan, the program client is responsible for the implementation of the program and for reporting the status of the program to the management. The program commissioner is also responsible for implementing changes in the program at the direction of the management. Within the organization of the change program, we refer to the members of the management who are involved in the implementation of the program as the 'sponsor group'.

Clear and consistent vision of the end result

The goals that have been established and described in the vision document and the desire to achieve them are the drivers for the change that must be achieved. We try to describe the sub-goals of the lowest level SMART:

- Specific - Is the objective unambiguous?
- Measurable - Under which (measurable/observable) conditions or form has the goal been achieved?
- Acceptable - Are these goals acceptable to the target audience and/or management?
- Realistic - Is the goal attainable?
- Time-bound - When (in time) must the goal be reached?

The goals are worked out in more detail in the program business case. This describes the business justification of the program. During the Program initiation workshop, we derive the goals from your organization's strategies, policies and initiatives.

Clear tasks, responsibilities, and authorities

Within the change program we guarantee a clear division of responsibility. This means that responsibilities, tasks and authorities are clearly described in the program plan and in the individual project plans of the projects.

Focus on added value

During the implementation of the program and therefore also during the implementation of the various activities and projects, we monitor the progress of the program as a whole and the progress of the various activities and projects of the program. Progress monitoring tools are:

- Periodic program consultation by the program client with the program manager and the change managers. The scope of this consultation is the program plan.
- Periodic project consultation by the program manager with the project managers of the various projects. The scope of this consultation is the project plan.

Activities and projects will have to have a positive impact on the KPIs after the transition of their results. This impact is evaluated during the program consultation. If necessary, the program plan will be adjusted on the basis of this to ensure that the objectives set in the vision document will be achieved.

Communication

In order to be able to implement the change program efficiently and effectively, communication about the program to all those involved must be clear and unambiguous. This communication focuses on those involved within your organization as well as outside it to third parties who participate in the implementation of the change program. As part of planning the program, an optional communication plan can be made. This plan is linked to the program plan and to the project portfolio. It contains a number of communication moments. For each communication moment we record:

- Moment of communication, linked to the program or relevant project component.
- Target group.
- Draft content.
- Current affairs.
- Medium / channel.
- Context and topicality.

Anchoring new ways of working

The Change Managers play an essential and important role in achieving the goals of the change program effectively. They must ensure that the results of activities and projects lead to new or adapted competencies for employees. In addition, they monitor that the competences learned are applied on a permanent basis and that there is no relapse to old working methods and habits.

Picking up new and adapted competencies is neither self-evident nor easy. Based on the existing corporate culture ('as we are used to doing...'), there may be a certain resistance among employees to adopting new or modified working methods.

Business case management

Within the framework of the program there is one program business case and there are separate business cases for the projects or clusters of projects. We can achieve the different results that the projects will deliver in more than one way, each of which yields different benefits. That is why every project needs its own project business case. For each project, the program client determines whether the business justification is sufficient to execute that project.



Summary

We hope to have inspired you with this Industry class about the ETO to CTO transition and that with this information helped you to develop a vision around CTO and has provided you with clear handles and strategy to make this CTO journey with your company in the coming years. Of course, it might deter you from taking this pretty big step. But then bear in mind Darwin's statement.

*“It is not the strongest of the species that survives,
Nor the most intelligent that survives
It is the one that is most adaptable to change”*

Useful Links

Cadac Group

[About Cadac](#)

[CTO @ Nooteboom trailers](#)

[CTO @ Ventura](#)

[CTO @ Goudsmit Magnetics](#)

[Kusters Engineering](#)

Learning Resource

[Whitepaper Product Thinking](#)

[Whitepaper Project Thinking part 1 \(Project Management\)](#)

[Whitepaper Project Thinking part 2 \(Program Management\)](#)